

I Claim:

1. An apparatus for proportioning a chemical with a solvent, comprising:  
a flow measurement apparatus for measuring the flow rate of the solvent;  
a control unit for calculating the quantity of chemical to be added to the solvent based at least in part on the flow rate of the solvent; and  
a flow control device for metering the quantity of the chemical added to the solvent.
2. The apparatus for proportioning a chemical with a solvent of claim 1, and further including:  
a second flow measurement apparatus for measuring the flow of the chemical.
3. The apparatus of claim 1, wherein:  
the control unit receives input from the flow measurement apparatus; and  
the control unit controls the flow control device.
4. The apparatus for proportioning a chemical with a solvent of claim 1, wherein:  
the chemical is a cleaning substance.
5. The apparatus for proportioning a chemical with a solvent of claim 1, wherein:  
the chemical is a soap.
6. The apparatus for proportioning a chemical with a solvent of claim 1, wherein:  
the solvent is water.
7. The apparatus for proportioning a chemical with a solvent of claim 1, wherein:  
the flow of the solvent varies during the operation of the apparatus.

8. The apparatus for proportioning a chemical with a solvent of claim 1, wherein:  
the flow rate of the solvent varies according to the quantity of a plurality of spray  
wands which are in operation at any given time.

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9. The apparatus for proportioning a chemical with a solvent of claim 1, wherein:  
the flow measurement device is a flow sensor.

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10. The apparatus for proportioning a chemical with a solvent of claim 1, wherein:  
the control unit is a personal computer.

11. The apparatus for proportioning a chemical with a solvent of claim 1, wherein:  
the flow control device is precision pump.

12. The apparatus for proportioning a chemical with a solvent of claim 1, wherein:  
the flow control device is a solenoid valve.

13. A method for proportioning a chemical in a vehicle wash system, comprising:  
(a) measuring the flow rate of the water;  
(b) calculating the flow rate of the chemical necessary to maintain a desired  
chemical proportion based at least in part on the flow rate of the water; and  
(c) operating a chemical metering apparatus to meter the flow rate of the  
chemical into the water.

14. The method of claim 13, and further including:  
(d) measuring the flow of the chemical to determine that the correct quantity of the  
chemical is being dispensed.

15. The method of claim 13, and further including:  
repeating steps a, b and c during the operation of the vehicle wash system.

16. The method of claim 14, and further including:  
repeating steps a, b, c and d during the operation of the vehicle wash system.
17. The method of claim 14, and further including:  
5 repeating steps c and d until the desired flow rate of the chemical is achieved.
18. The method of claim 13, wherein:  
step b is accomplished by a digital control apparatus.
- 10 19. The method of claim 13, wherein:  
step b is accomplished by a personal computer.
20. The method of claim 13, wherein:  
step b is accomplished using a proportioning algorithm.
21. The method of claim 13, wherein:  
step b is accomplished using a PID algorithm.
22. An apparatus for mixing a chemical with water in a vehicle washing device,  
20 comprising:  
water flow measurement means for measuring the flow of water;  
calculating means for calculating a desired flow rate for the chemical; and  
flow rate controlling means for controlling the flow rate for the chemical.
- 25 23. The apparatus of claim 22, and further comprising:  
chemical flow measurement means for measuring the flow rate of the chemical.
24. The apparatus of claim 22, wherein:  
the water flow measurement means is a flow sensor.

25. The apparatus of claim 22, wherein:  
the chemical flow measurement means is a flow sensor.

5 26. The apparatus of claim 22, wherein:  
the flow rate controlling means is a solenoid valve.

27. The apparatus of claim 22, wherein:  
the flow rate controlling means is a variable rate pump.

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28. The apparatus of claim 27, wherein:  
the variable rate pump is an air driven pump.

29. The apparatus of claim 22, and further including:  
at least one pump for providing the water under pressure.

30. The apparatus of claim 29, wherein:  
the pump is an air driven pump.

NOTICE: This correspondence chart is provided for informational purposes only. It is not a part of the official Patent Application

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## CORRESPONDENCE CHART

	10	WASH BAY
	12	VEHICLE
10	14	GANTRY
	16	NOZZLES
	18	SPRAY WAND
	20	FLEXIBLE TUBE
	100	CHEMICAL RATIO PROPORTIONING APPARATUS
5	102	MANUAL VALVE
	104	WAND PUMP
	106	AIR SUPPLY
	108	AIR SUPPLY VALVE
	109	WATER
20	110	WATER SOURCE
	112	WATER FLOW SENSOR
	114	CHEMICAL
	114a	SECOND CHEMICAL
	116	CHEMICAL STORAGE TANK
25	116a	SECOND CHEMICAL STORAGE TANK
	118	CHEMICAL FLOW SENSOR
	120	CONTROL UNIT
	122	FIELD COMMUNICATION BUS
	124	METERING PUMP
30	126	LEVEL SENSOR
	126a	SECOND LEVEL SENSOR

	128	MIX MANIFOLD
	200	ALTERNATE EMBODIMENT
	202	WATER FLOW PUMP
	204	WATER FLOW SENSOR
5	206	CHEMICAL FLOW PUMP
	206a	SECOND CHEMICAL FLOW PUMP
	208	PROPORTIONING SOLENOID VALVE
	208a	SECOND PROPORTIONING SOLENOID VALVE
	210	CHEMICAL FLOW SENSOR
10	210a	SECOND CHEMICAL FLOW SENSOR
	240	CHEMICAL PIPE
	242	WATER PIPE
	244	INJECTOR
	260	CHECK VALVES
5	400	VEHICLE WASH CHEMICAL PROPORTIONING METHOD
	402	MEASURE WATER FLOW OPERATION
	404	CALCULATE CHEMICAL FLOW OPERATION
	406	ADJUST CHEMICAL FLOW OPERATION
	408	MEASURE CHEMICAL FLOW OPERATION
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